NOAA FISHERIES

ALWTRT Whale Release Rope and Gear Marking Feasibility Subgroup In-Person Meeting

Facilitation by CONCUR: Scott McCreary
Bennett Brooks

Sheraton Providence Airport Hotel
April 3, 4 2018

What do we want to do today?

Mission: Inform the ALWTRT's efforts to produce a long-term framework for the further reduction of mortality and serious injury of large whales in US waters below their respective potential biological removal levels as mandated by the MMPA.

Create direction and guidance for Whale Release Rope and Gear Marking feasibility report for Fall 2018 ALWTRT meeting

- Develop and refine draft feasibility matrices to describe whale release rope and gear marking feasibility characteristics
- Provide guidance on data needs for the feasibility report
- Outline a work plan to support feasibility report drafting; includes tasks leads (NOAA Fisheries staff) and Subgroup members, as needed
- Brainstorm and summarize further research needs

Whale Release Rope/Gear Marking Feasibility Subgroup Members

Academic/Scientific Representatives	
Amy Knowlton (NEAq)	Bill McClellan (UNC)
Conservation/Environmental Representative	
Caroline Good (Duke)	
Fishery Management Organization Representatives	
Terry Alexander (NEFMC)	Charlie Phillips (SAFMC)
Megan Ware (ASMFC	Sonny Gwin (MAFMC)
State Fishery Resource Managers	
Bob Glenn (MA)	Erin Summers (ME)
Cheri Patterson (NH)	
Fishing Industry Representatives	
Dave Borden	John Haviland (Trap/Pot Northeast)
Patrice McCarron (Trap/Pot Northeast)	Nick Muto (Gillnet, Northeast)
Arthur (Sooky) Sawyer	John Williams (Trap/Pot Northeast)

NOAA ALWTRT Feasibility Subgroup Support

Colleen Coogan	TRT Subgroup Coordination	GARFO
Mike Asaro	Marine Mammal and Sea Turtle Branch Chief	GARFO
Dave Morin	Large Whale Disentanglement Coordinator	GARFO
Mark Minton	Recovered Gear Custodian/Enforcement Liaison	GARFO
Glenn Salvador	Fishing Gear Specialist	GARFO
John Higgins	Fishing Gear Specialist	GARFO
Allison Rosner	Marine Mammal Specialist, Outreach Coordinator	GARFO
Peter Burns	Lobster Fishery Management	GARFO
Kristy Long	National TRT Coordinator	OPR
Nick Sisson	Knauss Fellow, National TRT Support	OPR
John Almeida	Attorney	GCNE
Charles Lynch	Attorney	GCNE
Christin Khan	Right Whale Aerial Survey Biologist	NEFSC
Eric Matzen	Fishing Gear Researcher	NEFSC
Henry Milliken	Fishing Gear Researcher	NEFSC
Kathryn Bisack	Economist	NEFSC
Eric Thunberg	Social Sciences Branch Chief	NEFSC
Barb Zoodsma	Southeast U.S. Right Whale Recovery Coordinator	SERO
Jessica Powell	Marine Mammal Specialist	SERO

Invited Experts

Laurens Howle – Duke University Mechanical Engineering and Materials Science

Myron Horzesky – Ketcham Supply Co.

By teleconference: Brian Morrison, Industrial Economics

Agenda for April 3, 2018 - morning

10:00 Welcome

Review purpose and context for today's meeting
Introductions, agenda review and ground rules

10:20 Entanglement Analysis

Summary of entanglement analyses – NMFS

- Observations relative to gear identification and gear marking
- Observations relative to any detectable changes in types of gear seen
- Right whale entanglement case studies; NOAA cases from 2001 - 2015, and Bycatch Consortium entanglement case studies

11:00 Fixed gear effort distribution

Co-occurrence model update – Brian Morrison, Industrial Economics

12:00 LUNCH – Place Orders

Agenda for April 3, 2018 - afternoon

1:00 Gear Marking

Discussion of past studies and conclusions on gear marking research

- Review existing U.S. requirements; Canadian gear marking requirements - Asaro
- Review options considered to date – Gear Team

1:45 Discuss marking goals and associated feasibility characteristics

3:00 Break

3:20 Gear observations

Sort through binned gear removed from entangled right whales and associated case studies. :

4:30 Effects of fishing rope strength on the severity of large whale entanglements

- Review findings of study - Knowlton
- Discuss physics of breaking rope – Lars Howle

5:45 Opportunity for broader audience participation

6:00 Wrap up and adjourn

Agenda for April 4, 2018

8:00 Recap

8:45 Discuss breaking strengths observed in commercial fishery operations

9:30 Discuss whale release rope designs

10:30 Review feasibility matrix developed from the teleconference

11:15 - Summarize and consider implications

12:00Lunch

1:00 Identify additional information needed to inform ALWTRT discussion of whale release rope and gear marking feasibility investigation

2:20 Assignments and Next Steps

3:15 Opportunity for broader audience participation

3:30 Wrap up and adjourn

Ground Rules

Take Reduction Team Operating Protocols, and these additional guiding principles:

1. Subgroups are fact-finding and problem-solving, not decision-making, groups.
2. Subgroup members will review materials in advance and arrive fully prepared to participate.
3. Subgroup members will strive to attend all scheduled in-person meetings and webinars.
4. Subgroup members will jointly guide the direction of these conversations and will identify areas for further investigation paying particular attention to researching whether there are solutions to apparent barriers to feasibility. NOAA Fisheries, CONCUR, and outside experts will be available for support, facilitation, and expertise during meetings, and for assignments resulting from meetings.
5. Subgroup members will strive to identify outside expertise for NOAA Fisheries to invite to help inform discussions.
6. The many opinions expressed during subgroup meetings will drive the fact-finding efforts. All opinions and input will be fully considered and characterized in the subgroup reports for consideration by the full Team.
7. Subgroup members are asked to report out to and solicit input from the constituents they represent on the Team.

Right Whale Entanglements

- Overview of entanglement analysis, 2007 - 2017(.ppt)
- NOAA cases from 2001 - 2015,
- Bycatch Consortium entanglement case studies

Fixed gear effort distribution

GoToMeeting Invitation - Update on Co-occurrence Model (Morrison)
Update on Co-occurrence Model (Morrison)
Tue, Apr 3, 2018 11:00 AM - 12:00 PM EDT

Please join my meeting from your computer, tablet or smartphone.
https://global.gotomeeting.com/join/260637285

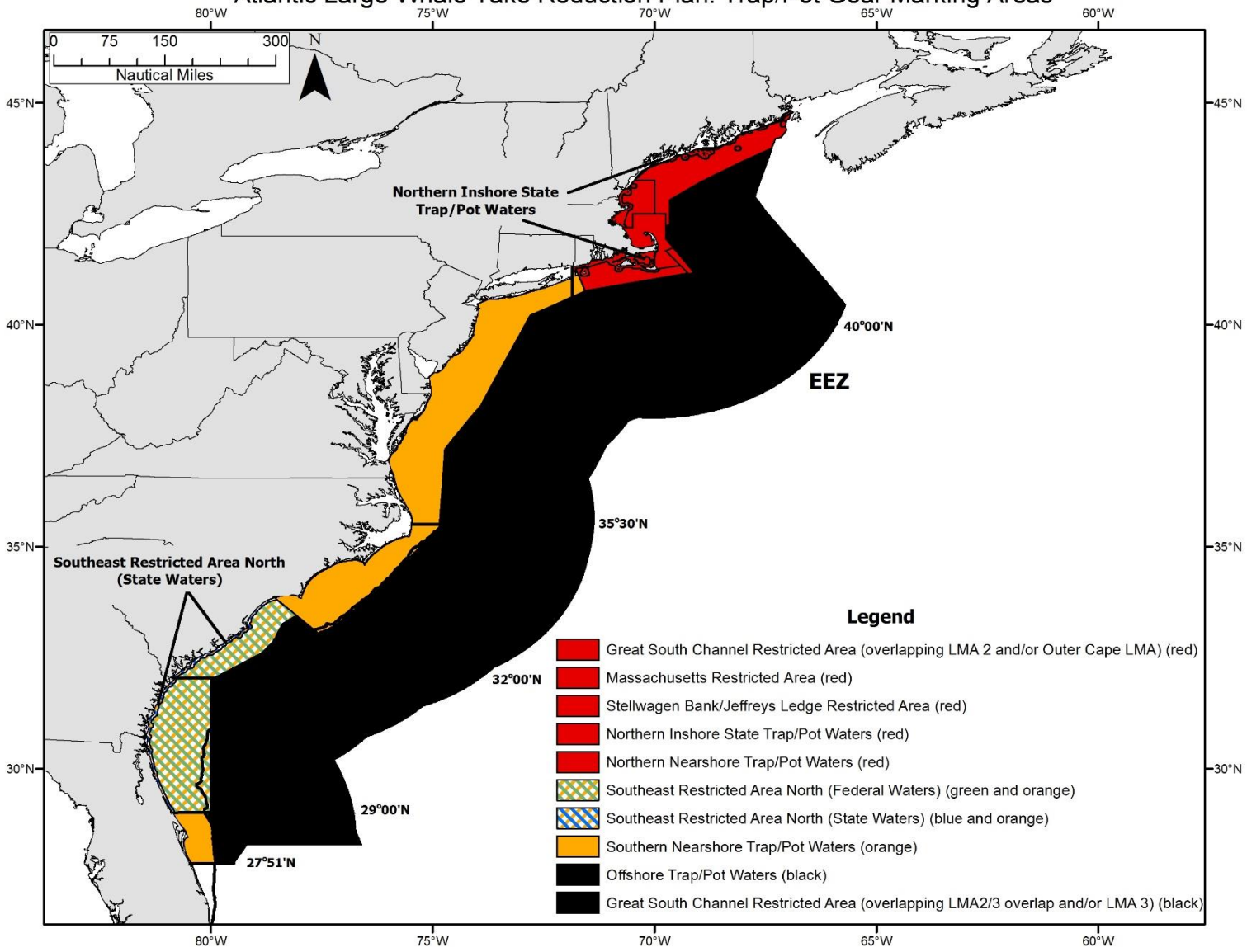
You can also dial in using your phone.
United States: +1 (646) 749-3122
Access Code: 260-637-285
First GoToMeeting? Let's do a quick system check:
https://link.gotomeeting.com/system-check

US Gear Marking

Trap/Pot Gear Marking

Required color	Management Area
Red	MA Restricted Area, Northern Nearshore Trap/Pot, Northern Inshore State Trap/Pot, Stellwagen Bank/Jeffreys Ledge Restricted Area, Great South Channel Restricted Area overlapping LMA 2 and/or Outer Cape
Orange	Southern Nearshore Trap/Pot
Black	Offshore Trap/pot, Great South Channel Restricted Area overlapping with LMA 2/3 overlap and/or LMA 3
Blue & Orange	Southeast Restricted Area North (State waters)
Green & Orange	Southeast Restricted Area North (Federal waters)

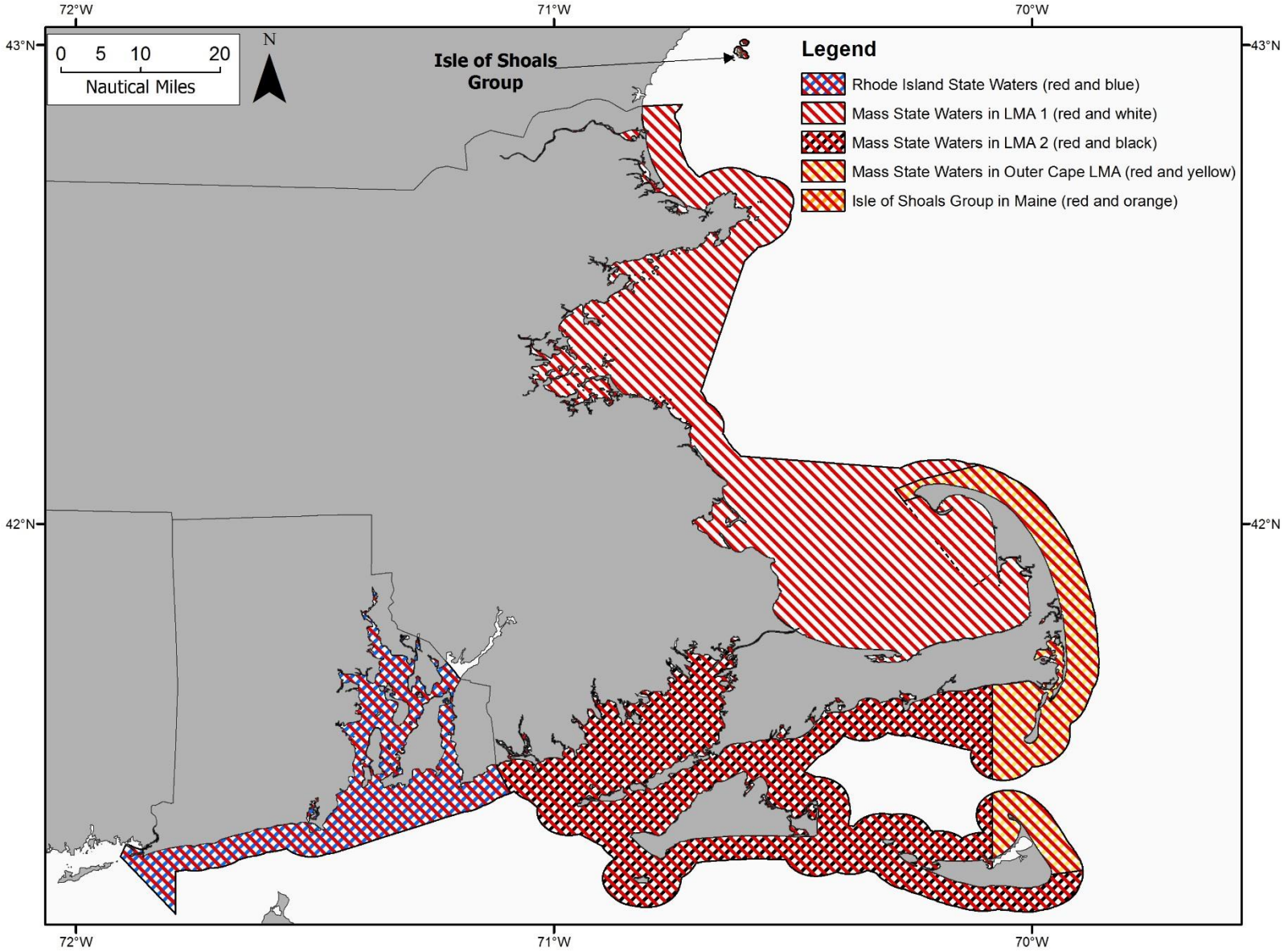
Atlantic Large Whale Take Reduction Plan: Trap/Pot Gear Marking Areas



Singles Trap/Pot Gear Marking

Required color	Management Area
Red & Blue	RI state waters
Red & White	MA state waters in LMA 1
Red & Black	MA state waters in LMA 2
Red & Yellow	MA state waters in Outer Cape
Red & Orange	Isle of Shoals group, Maine

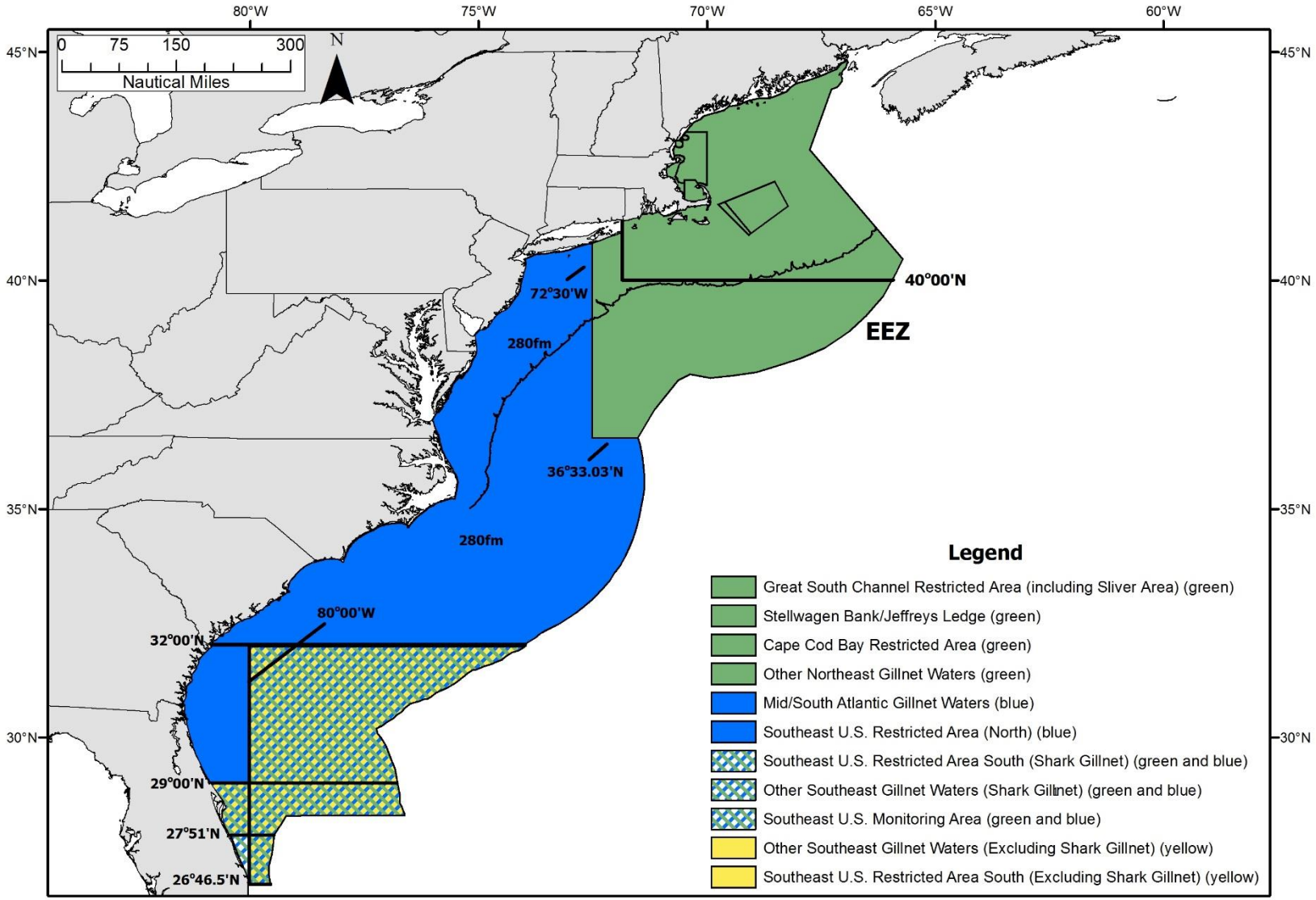
Atlantic Large Whale Take Reduction Plan: Northeast Trap/Pot Singles Gear Marking Areas



Gillnet Gear Marking

Required Color	Management Area
Green	Cape Cod Bay Restricted Area, Great South Channel Restricted Area, Great South Channel Sliver Restricted Area, Stellwagen Bank/Jeffreys Ledge Restricted Area, Other Northeast Gillnet Waters
Blue	Mid/South Atlantic Gillnet Waters
Yellow	Excluding Shark Gillnet: Southeast US Restricted Area South, Other Southeast Gillnet Waters
Green & Blue	Shark Gillnet: Southeast US Monitoring Area, Southeast US Restricted Area South, Other Southeast Gillnet Waters

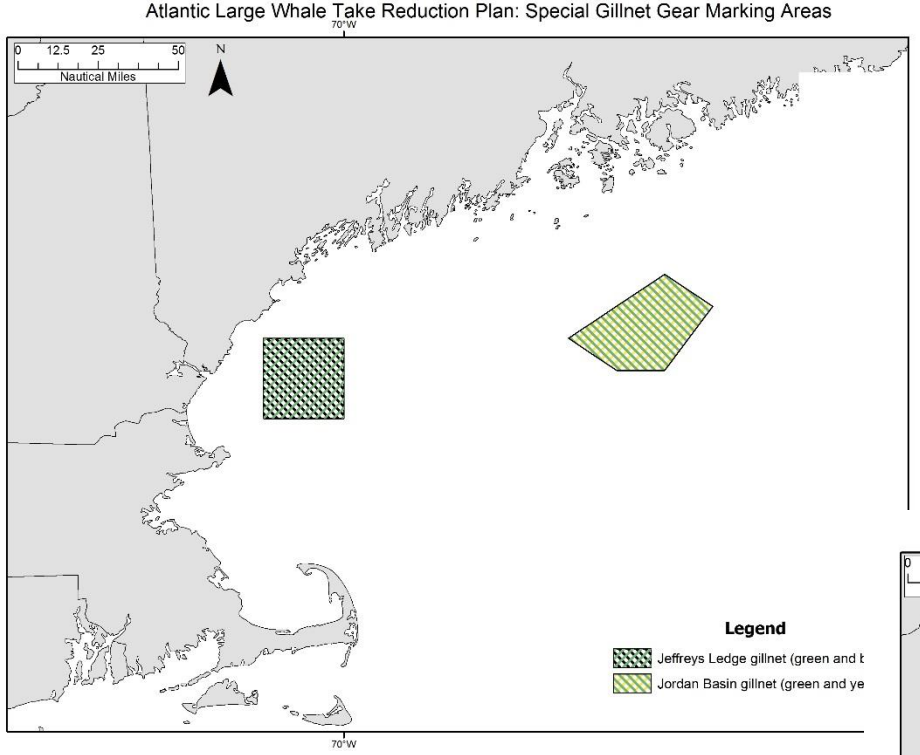
Atlantic Large Whale Take Reduction Plan: Gillnet Gear Marking Areas



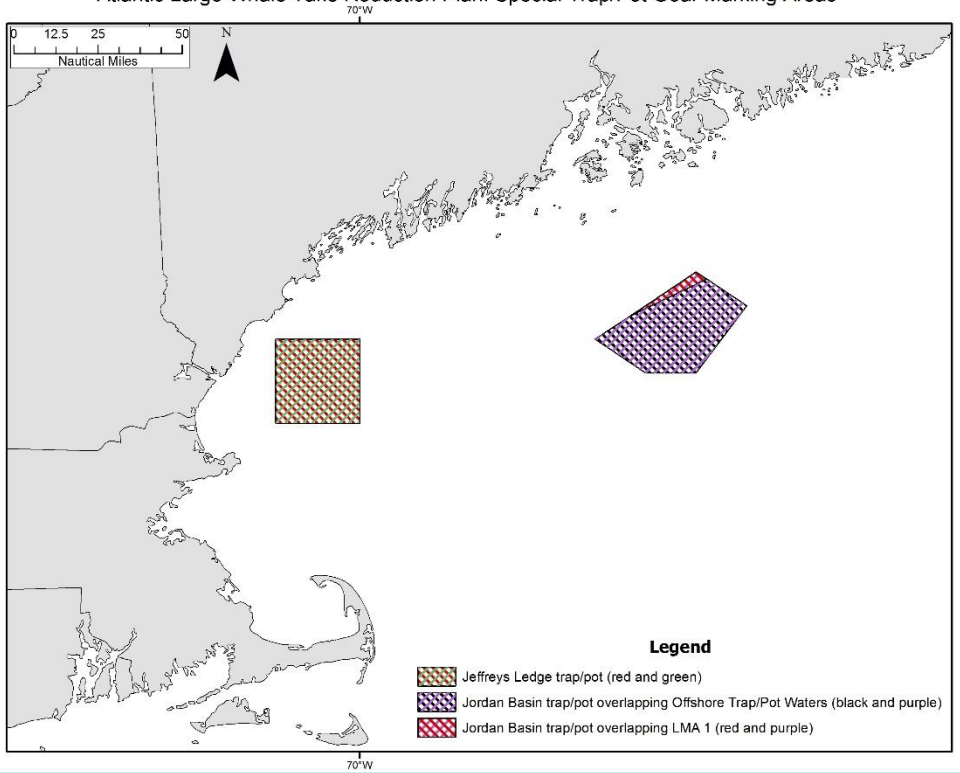
Special Gear Marking Areas

Required Color	Management Area
Red & Purple	Jordan Basin trap/pot overlapping LMA 1
Black & Purple	Jordan Basin trap/pot overlapping offshore trap/pot waters
Green & Yellow	Jordan Basin gillnet
Red & Green	Jeffreys Ledge trap/pot
Green & Black	Jeffreys Ledge gillnet

Atlantic Large Whale Take Reduction Plan: Special Gillnet Gear Marking Areas



Atlantic Large Whale Take Reduction Plan: Special Trap/Pot Gear Marking Areas

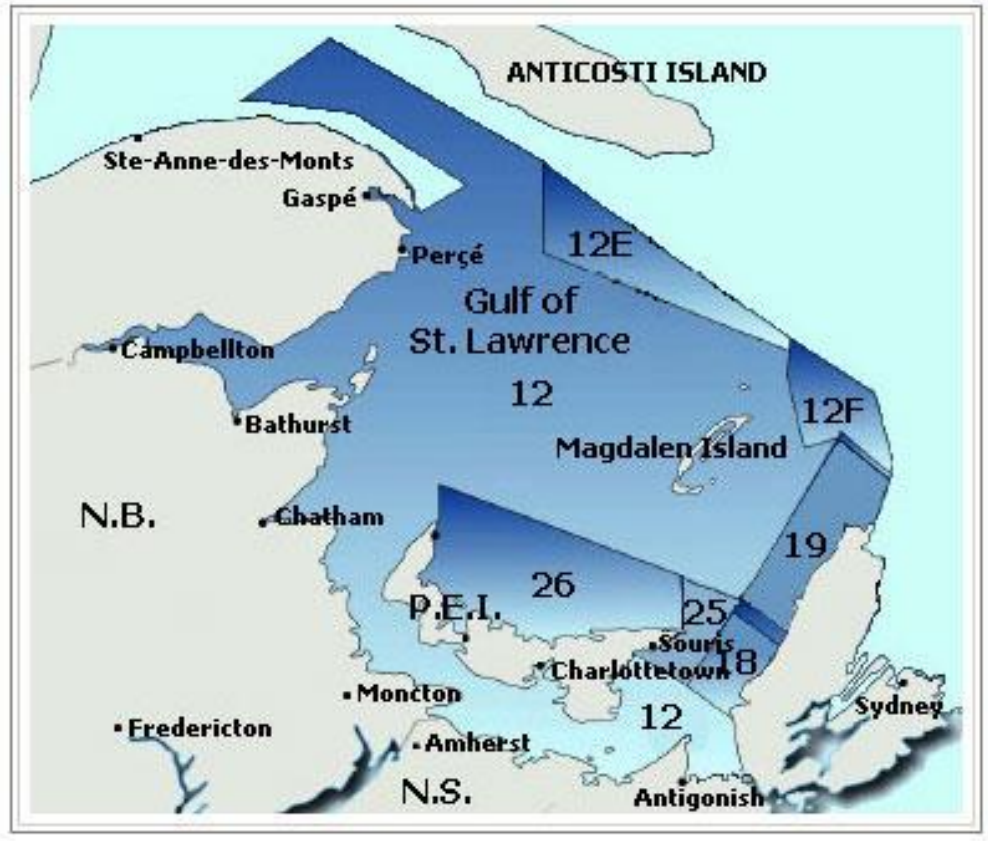


Canada Gear Measures

Gear Marking
Buoy Identification
Report Lost Gear

Gear Marking

- Mark rope used to attach crab trap to primary buoy line with color specific to fishing area
  - 12, 18, 25, 26 (orange)
  - 12E (yellow)
  - 12F (blue)
  - 19 (green)



Gear Marking

- Marks must be 15cm (~6”) in length and marked every 27.4 meters (15 fathoms).
- Marks can be made using colored twine or colored tape in such a way that it remains permanently affixed to the rope.
- The color used for markings should contrast with the color of rope.

Buoy Identification

- In addition to the current regulatory requirement to mark buoys with the vessel registration number (VRN), licence holders will be required to identify each primary buoy with a sequential number as to be capable of individually identifying each crab trap.
- The sequential number shall be solid block Arabic numerals:
  - without ornamentation;
  - written in a smaller or bigger scale than the VRN so as to be capable of differentiating the number from the VRN; and
  - in a color that contrast with their background.

Report Lost Gear

- License holds are required to report lost gear to DFO by email within 72 hours of noticing gear has been lost.
- Required to report the following information:
  - the sequence number of the tag attached to the crab trap that has been lost;
  - the VRN and identification number written on the primary buoy;
  - the latitude and longitude of last known position of lost crab trap; and
  - the date the crab trap was last fished.

Past Gear Marking Efforts, updated March 2018

Title	Report year	Gear tested	Summary	Safe?	Operational?	Costs?	Recommendations?
FAO Report on the EXPERT CONSULTATION ON THE MARKING OF FISHING GEAR, April 2016	2016	Review of gear marking alternatives. Not ALWTRT product but draft report includes summary of ALWTRT research projects	Investigates marking to identify source of abandoned, lost or otherwise discarded fishing gear.	Not discussed	Not discussed	Varied	See lists of gear marking alternatives, starting on p. 25 of the report. Final agreed- upon guidelines anticipated soon. The draft of this report summarizes ALWTRT research on coded wire and RFID tags
Jan. 2012 ALWTRT Gear Marking Discussion Paper	2012		Lays out questions etc.	Not discussed	Not discussed		January 2012 Key outcomes pages 16 and 17 for extensive comments including recommendations
NOAA RFID Fishing Line Tagging Patton and Cromhout	2011	Determine the feasibility of RFID technology to tag deep sea fishing line, and to discover effective methods of attaching these tags.	UHF RFID technology feasible but attachment methods to survive winch and pulley not achieved;	Not discussed	If effective attachment found	Tag itself considered low-cost	Suggested: future research needed testing very long inlays with ends that are further apart and less likely to foul in the winch, or non-removable inlays integrated into the line further work on this topic will most likely focus on the area of material attachment rather than RF technology. Lab development of attachment methods is desired.
April 2011 Gear Marking Concepts, powerpoint for ALWTRT meeting	2011	NA	Clarifies intent of gear marking, pros and cons of existing schemes and alternatives	Not discussed	Not discussed	Not discussed	Per April 2011 Mid Atlantic/Southeast key outcomes memo, participants said the gear-marking should capture both the geographic region of the fishery and the gear type; should be frequent enough to facilitate identification even if only a small amount of gear is retrieved from an entangled animal. (suggested NMFS's approach be informed by data from disentanglement teams, as well as a selection of marking intervals tied to typical line lengths for each fishery.). Industry strongly urged that any gear-marking scheme not jeopardize compliant fishermen
Gear Marking Discussion Paper For Distribution to the ALWTRT November 2010	2010	NA	Discussed limitations of existing requirements, discussed retrieved marked vs. unmarked gear, pros and cons of alternative schemes	Not discussed	Matrix comparing alternatives	See table	

Title	Report year	Gear tested	Summary	Safe?	Operational?	Costs?	Recommendations?
An Automated RFID and GPS Fixed Gear Identification System for Onboard Realtime Data Collection' UNH/Blue Water UNH	2010	Radio frequency identification (RFID) scheme using microchip technology and a global positioning system (GPS) to monitor fixed gear end lines	Identified RFID embedding technique for twisted line that improved retention and readability. Operationally still difficult	Not discussed	Not yet	Not discussed	More investigation. Build self- contained unit for commercial deployment
Investigation of Practical Aspects of Marking Fixed Fishing Gear With Coded Wire Tags To Better Understand Whale Entanglement Final Grant Report for the International Fund for Animal Welfare	2009	Coded wire tag retention under fishing conditions	~ 75% retention of tags; >90% of retrieved tags were readable, no safety concerns, insertion techniques operationally impractical for full fishery implementation. From 1997 to 2003; 61 pieces from 5 to 1200 feet; they looked at the average and the frequency of various lengths and included this discussion of marking intervals: "... if rope were marked every 12 feet, on average we could expect get the information contained in the mark 95% of the time rope was removed from an entangled whale. Alternatively, if rope were marked every 40 feet we could expect get the information provided by the mark 90 % of the time, because at least 40 feet of rope is likely to be recovered."	Not discussed	Not yet	Not discussed	Worth more study; suggest marking every 40 feet per their cost/benefit discussion
Weak Line and Buoy Line Marking Techniques; from Large Whale Research Summary 2000	2000	From 2000 Summary Report. Demonstration of marking techniques	Demonstration only	Y	Y	Reasonable	

Feasibility Matrix

- Identify alternative on top
- Work in groups to provide additional information on feasibility characteristics for further investigation

Gear Marking Alternative:

Discuss ways to articulate these feasibility concerns and identify further research needed. Consider selecting a "rating", such as identifying whether the feasibility consideration represents a big, medium, or small challenge and note with B,M or S.

Feasibility Consideration	B, M, or S. Challenge?	Nature of challenge and recommended action
Characteristics related to Primary goals		
Target catch retention		
Large whale entanglement reduction – short term (~1-5 yrs)		
Large whale entanglement reduction – long term (~10 yrs)		
Operational feasibility characteristics		
Relative Safety		
Gear conflict		
Usable on current fixed gear fisheries		
Ability to withstand commercial fishing conditions over time		
Ability to identify location of fishing		
Ability to identify depth fished		
Ability to identify amounts/weights of gear fished		
Portability between fishing or management areas to accommodate fishing practices		
Ability to accommodate different rules in different areas or seasons		
Ease of implementation for fishermen		
Cost feasibility characteristics		
[illegible]		